

## **PART I - ADMINISTRATIVE**

### **Section 1. General administrative information**

<b>Title of project</b> Sherman Creek Hatchery O&M.	
<b>BPA project number</b>	9104700
<b>Contract renewal date (mm/yyyy)</b>	06/2016
<b>Multiple actions? (indicate Yes or No)</b>	No
<b>Business name of agency, institution or organization requesting funding</b> Washington State Department of Fish and Wildlife	
<b>Business acronym (if appropriate)</b>	WDFW
<b>Proposal contact person or principal investigator:</b>	
<b>Name</b>	Mitch Combs
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<b>NPPC Program Measure Number(s) which this project addresses</b> 10.8b, 10.8b.2	
<b>FWS/NMFS Biological Opinion Number(s) which this project addresses</b> Not applicable.	
<b>Other planning document references</b> NPPC , Columbia River Basin F&W Program, Resident Fish Substitutions: 10.8, 10.8A, 10.8B, 10.8B.1, through 10.8B.5, and 10.8B.11. Upper Columbia Blocked Area Management Plan, 1998.	
<b>Short description</b> Sherman Creek Hatchery's (SCH) primary objective is the restoration and enhancement of the Lake Roosevelt and Banks Lake fisheries. SCH is listed as a specific action in the September 13, 1995 FWP Sec. 10.8b.2. The hatchery was constructed in 1991, at which time WDFW and BPA entered into a non-discretionary 25 year contract to fund the operations and maintenance. Monitoring and evaluation are by the Lake Roosevelt Fisheries Monitoring Project (No. 9404300).	
<b>Target species</b> Lake Whatcom Stock kokanee salmon, native Kootenay Lake Stock kokanee salmon, Spokane Stock rainbow trout, and native red band rainbow trout.	

## Section 2. Sorting and evaluation

<b>Subbasin</b>
Upper Columbia Mainstem - Above Grand Coulee Dam

### ***Evaluation Process Sort***

CBFWA caucus		CBFWA eval. process		ISRP project type	
X one or more caucus		If your project fits either of these processes, X one or both		X one or more categories	
	Anadromous fish	X	Multi-year (milestone-based evaluation)		Watershed councils/model watersheds
X	Resident Fish		Watershed project eval.		Information dissemination
	Wildlife			X	Operation & maintenance
					New construction
					Research & monitoring
					Implementation & mgmt
					Wildlife habitat acquisitions

## Section 3. Relationships to other Bonneville projects

***Umbrella / sub-proposal relationships.*** List umbrella project first.

Project #	Project title/description

### ***Other dependent or critically-related projects***

Project #	Project title/description	Nature of relationship
9104600	Spokane Tribal Hatchery O&M (STH)	Operated conjunctively with Sherman Creek Hatchery to maximize the attributes of each facility while optimizing production. STH is the primary incubation, and early rearing facility.
9500900	Volunteer Rainbow Trout Net Pen Project	Net Pen Project rears 530,000 rainbow trout yearlings initially raised at Sherman Creek and Spokane Tribal Hatcheries for annual release into Lake Roosevelt.
5228100	Lake Roosevelt Kokanee Net Pens	These net pens will rear 500,000

		kokanee yearlings transferred from Spokane Tribal Hatchery for annual release into Lake Roosevelt.
9404300	Lake Roosevelt Monitoring/Data Collection Program (LRM/DCP)	Monitors and evaluates effects of hatcheries and stocking on Lake Roosevelt fisheries; collects fisheries and limnological data for reservoir modeling.
9001800	Habitat Improvement Project	Habitat improvement in Lake Roosevelt tributaries for rainbow trout juvenile rearing and adult passage to increase natural production.
9501100	Chief Joseph Kokanee Enhancement Project	Monitors native kokanee stock interactions and development, and fish entrainment through Grand Coulee Dam.
9502700	Lake Roosevelt Sturgeon Project	Restoration and enhancement of the Lake Roosevelt fishery.
	Ford Hatchery Water Supply Improvement	Increased kokanee survival through increased yearling releases.
	Phalon Lake Rainbow Trapping Facility	This native red band rainbow trout project will supply native trout for net pen and tributary stocking in the Upper Columbia River Basin.
	Lake Roosevelt Hatcheries Coordination Team	Fishery managers from above projects, meet quarterly for project review and coordination / information sharing.
9700400	Resident Fish Stock Status Above Chief Joseph/Grand Coulee Dam	Informational exchange / Blocked Area Coordination.

## Section 4. Objectives, tasks and schedules

### *Past accomplishments*

Year	Accomplishment	Met biological objectives?
1992	Annual Operating Plan (AOP). Completed Annual Production Goals (APG): 1,022,639 kokanee salmon, (45,714 as yearling kokanee)	Yes - Within facility rearing constraints / as cited in Sherman Creek Hatchery (SCH) - 1993 Annual Report
1993	AOP - Completed. APG: 988,070 kokanee salmon, (85,321 as yearling kokanee)	Yes - as cited in Sherman Creek Hatchery 1994 Annual Report
1994	AOP - Completed. APG: 1,072,921 kokanee salmon, (126,159 as yearling kokanee)	Yes - as cited in Sherman Creek Hatchery 1995 Annual Report
1995	AOP - Completed. APG: 275,609 yearling	Yes - as cited in Sherman Creek

	kokanee salmon and 101,116 rainbow trout	Hatchery 1996 Annual Report
1996	AOP - Completed. APG: 286,253 yearling kokanee salmon and 142,072 rainbow trout	Yes - as cited in Sherman Creek Hatchery 1997 Annual Report
1997	AOP - Completed. APG: 265,313 yearling kokanee salmon and 140,359 rainbow trout	Yes - as cited in Sherman Creek Hatchery 1998 Annual Report
1998	AOP - Completed. APG: 487,000 yearling kokanee salmon and 195,000 rainbow trout	Yes - will be cited in 1999 Sherman Creek Hatchery Annual Report

### **Objectives and tasks**

<b>Obj 1,2,3</b>	<b>Objective</b>	<b>Task a,b,c</b>	<b>Task</b>
1	Acclimate 255,000 kokanee yearlings	a	Rear for release in July, 255,000 kokanee salmon at 15 fish per pound or larger from Sherman Creek raceways
2	Acclimate 200,000 kokanee yearlings	a	Rear for release in May, 200,000 kokanee salmon at 15 fish per pound or larger from Sherman Creek net pens
3	Rear 200,000 rainbow trout fingerlings	a	Rear and transfer to Lake Roosevelt net pens in October 200,000 rainbow trout at 15 fish per pound for final rearing.
4	Capture adult kokanee returning to Sherman Creek	a	Using all available methods to collect, trap, electrofish and net adult kokanee returning to Sherman Creek for spawning / egg take goals.
		b	Coordinate with other fishery managers on Lake Roosevelt to collect and propagate other mature kokanee
		c	Collect, compile and manage biological information from returning fish relative to age composition, size, survival, maturity and coded wire tagging
5	Assist with Volunteer Rainbow Trout Net Pen Project	a	Provide technical assistance to volunteer cooperators rearing rainbow trout on project 9500900.
		b	Provide help and equipment on volunteer rainbow net pen project when time and resources permit.
6	Native Stocks Utilization	a	Seek alternate brood sources (ie Native Kootenay Lake kokanee / indigenous red band rainbow) to utilize and promote as available.
7	Lake Roosevelt	a	Inter project coordination between

<b>Obj 1,2,3</b>	<b>Objective</b>	<b>Task a,b,c</b>	<b>Task</b>
	Fishery Enhancement		related projects on Lake Roosevelt through data collection / equipment sharing / and fishery management recommendations.
8	Fish Health Monitoring	a	Monthly fish health monitoring and recommendations for both Sherman Creek Hatchery and Spokane Tribal Hatchery (9104600) are conducted by WDFW Fish Health Division.

### **Objective schedules and costs**

<b>Obj #</b>	<b>Start date mm/yyyy</b>	<b>End date mm/yyyy</b>	<b>Measureable biological objective(s)</b>	<b>Milestone</b>	<b>FY2000 Cost %</b>
1	03/2000	07/2000	Plant into Lake Roosevelt 255,000 kokanee yearling		26 %
2	10/1999	06/2000	Plant into Lake Roosevelt 200,000 kokanee yearling		20 %
3	07/2000	10/2000	Rear 200,000 rainbow fingerlings for net pen stocking.		19 %
4	09/2000	12/2000	Collect returning adult kokanee.	Adult trapping overlaps FY's.	15 %
5	10/1999	09/2000	Rear and release net pen rainbow trout.		10 %
6	10/1999	09/2000	Utilize native stocks		3 %
7	10/1999	09/2000	Coordinate restoration and enhancement efforts.		4 %
8	10/1999	09/2000	Fish Health Monitoring		3 %
				<b>Total</b>	100 %

#### **Schedule constraints**

Hydropower operations can necessitate time changes in rearing / planting schedules and have caused survival limitations on resident fish in Lake Roosevelt.

Availability of native stocks limit the use of alternate brood sources and target stocks.

#### **Completion date**

N/A

## **Section 5. Budget**

<b>FY99 project budget (BPA obligated):</b>	<b>\$319,486</b>
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***FY2000 budget by line item***

<b>Item</b>	<b>Note</b>	<b>% of total</b>	<b>FY2000 (\$)</b>
Personnel	Fish Hatchery Specialist 3 1.0 FTE Fish Hatchery Specialist 2 .75 FTE Fish Health Specialist .08 FTE Division Manager .08 FTE	36 %	72,665
Fringe benefits		10 %	19,967
Supplies, materials, non-expendable property		18 %	35,493
Operations & maintenance	Complete 1997 Flood caused damage to intake /outlet as needed.	6 %	12,000
Capital acquisitions or improvements (e.g. land, buildings, major equip.)	Replacement hatchery vehicle and fish transport / water tank.	14 %	30,000
NEPA costs		0	0
Construction-related support		0	0
PIT tags	# of tags:	0	0
Travel		1 %	2,380
Indirect costs	Administrated Overhead: 20.0% of Total less Capital Purchases and Fish Feed	13 %	25,962
Subcontractor		0	0
Other	Equipment Operations and Maintenance	2 %	3,950
<b>TOTAL BPA REQUESTED BUDGET *</b>			<b>201,397</b>

\* Less utility return of \$1,020

***Cost sharing***

<b>Organization</b>	<b>Item or service provided</b>	<b>% total project cost (incl. BPA)</b>	<b>Amount (\$)</b>
Lake Roosevelt Development Association	Lake Roosevelt Rainbow Trout Net Pen Project		
Spokane Tribe	Little Falls Dam Kokanee Trap		
<b>Total project cost (including BPA portion)</b>			

***Outyear costs***

	<b>FY2001</b>	<b>FY02</b>	<b>FY03</b>	<b>FY04</b>
<b>Total budget</b>	176397	181,689	187,140	192,754

## Section 6. References

<b>Watershed?</b>	<b>Reference</b>
	Beckman, L.G., Novotny, J.F., Parsons, W.R., Tarrell, T.T. 1985. Assessment of the fisheries and limnology in Lake F.D. Roosevelt 1980-1983. U. S. Fish and Wildlife Service. Final Report to U. S. Bureau of Reclamation. Contract No. WPRS-0-07-10-X0216; FWS-14-06-009-904, May 1985.
	Cichosz, T., Shields, J., Underwood, K., Tilson, M.B., and Scholz, A.T. 1997. Lake Roosevelt Fisheries and Limnological Research. Annual Report 1996. Spokane Tribe of Indians. 94-043, Bonneville Power Administration, Portland, Oregon.
	Columbia River Basin Fish and Wildlife Program. 1994. Application For Amendment. Section 10.8B Resident Fish Substitution Projects Above Chief Joseph/Grand Coulee Dam. Northwest Power Planning Council, Portland, Oregon.
	Columbia River Basin Fish and Wildlife Program. 1995. Section 10 Resident Fish, Section 10.8 Resident Fish Substitutions. 95-4, Northwest Power Planning Council, Portland, Oregon.
	Combs, M. 1992. Sherman Creek Hatchery Annual Report April 1, 1992 - September 30, 1992. Washington Department of Fish and Wildlife. DE-B179-91BP21191, Bonneville Power Administration, Portland, Oregon.
	Combs, M. 1993. Sherman Creek Hatchery Annual Report October 1, 1992 - September 30, 1993. Washington Department of Fish and Wildlife. DE-B179-91BP21191, Bonneville Power Administration, Portland, Oregon.
	Combs, M. 1994. Sherman Creek Hatchery Annual Report October 1, 1993 - September 30, 1994. Washington Department of Fish and Wildlife. DE-B179-91BP21191, Bonneville Power Administration, Portland, Oregon.
	Combs, M. 1995. Sherman Creek Hatchery Annual Report October 1, 1994 - February 28, 1995. Washington Department of Fish and Wildlife. DE-B179-91BP21191, Bonneville Power Administration, Portland, Oregon.
	Combs, M. 1995. Sherman Creek Hatchery Annual Report March 1, 1995 - September 30, 1995. Washington Department of Fish and Wildlife. DE-B179-91BP21191, Bonneville Power Administration, Portland, Oregon.
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	Griffith, J.R., Scholz, A.T. 1991. Lake Roosevelt Monitoring Program. Annual Report 1990. DE-8179-88BP91819, Bonneville Power Administration, Portland,

	Oregon.
	Peone, T., Scholz, A.T., Griffith, J.R., Graves, S. and Thatcher, M.G. 1990. Lake Roosevelt Fisheries Monitoring Program. Annual Report, 1988-89. DE-8179-88 BP91819, Bonneville Power Administration, Portland, Oregon.
	Peone, T. 1996. Spokane Tribal Hatchery Annual Report January 1, 1996 - December 31, 1996. Spokane Tribe of Indians. DE-MS79-90BP92906, Bonneville Power Administration, Portland, Oregon.
	Scholz, A.T., Uehara, J.K., Hisata, J., and Marko, J. 1986. Feasibility report on restoration and enhancement of Lake Roosevelt Fisheries. In: Northwest Power Planning Council, Application for amendments. Vol 3A. Northwest Power Planning Council, Portland, Oregon.
	Thatcher, M.G., Griffith, J.R., McDowell, A.C., and Scholz, A.T. 1993. Lake Roosevelt Fisheries Monitoring Program. Annual Report 1991. DE-8179-BP91819, Bonneville Power Administration, Portland, Oregon.
	Thatcher, M.G., McDowell, A.C., Griffith, J.R., and Scholz, A.T. 1994. Lake Roosevelt Fisheries Monitoring Program. Annual Report 1992. DE-8179-BP91819, Bonneville Power Administration, Portland, Oregon.
	Underwood, K.D., Shields, J., and Tilson, M.B. 1996. Lake Roosevelt Fisheries Monitoring Program, 1994 Annual Report. Project No. 88-63, Bonneville Power Administration, Portland, Oregon.
	Upper Columbia Fishery Managers.(1998-in press). WDFW Upper Columbia Blocked Area Management Plan. Washington Department of Fish and Wildlife. Olympia, Washington.

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## PART II - NARRATIVE

### Section 7. Abstract

Sherman Creek Hatchery's (SCH) primary objective is the restoration and enhancement of the recreational and subsistence fishery in Lake Roosevelt and Banks Lake. This facility began operations in 1992 as one of two kokanee salmon / rainbow trout facilities provided to partially mitigate for the loss of anadromous fish in Northeastern Washington due to the construction of Grand Coulee Dam. Sherman Creek Hatchery was approved by the Northwest Power Planning Council as a measure in the Columbia River Basin Fish and Wildlife Program, Section 10.8b, 10.8B.2, (1987, 1995). The role of the Sherman Creek Hatchery in this program is to; {a} provide for kokanee imprinting and egg collection; {b} enhance the resident fishery within Lake Roosevelt; and {c} rear rainbow trout for net pen stocking. The Washington Department of Fish and Wildlife, Spokane Tribe of Indians and the Colville Confederated Tribe form an interagency technical coordination team which sets goals and objectives for both Sherman Creek and the Spokane Tribal Hatchery and serves to coordinate enhancement efforts on Lake Roosevelt and Banks Lake. Current annual production goals include: 455,000 yearling kokanee salmon and 200,000 rainbow trout fingerlings. Current objectives include increased use of native / indigenous stocks where available for propagation into Upper Columbia River Basin Waters. Monitoring and evaluation for this project is by the Lake Roosevelt Monitoring / Data Collection Program.

## Section 8. Project description

### a. Technical and/or scientific background

The Northwest Power Planning Council (NPPC) amended into their 1987 Columbia River Basin Fish and Wildlife Program (NPPC 1987) the construction and operation of two fish hatcheries as partial mitigation for the loss of resident fish and anadromous fish habitat due to the construction of Grand Coulee Dam in 1941. This was in part brought on by a feasibility study on restoring and enhancing the Lake Roosevelt fisheries (Scholz et al. 1986). The study recommended that two facilities, managed by the Spokane Tribe and Washington State Department of Fish and Wildlife (WDFW), be constructed to enhance the resident fishery on Lake Roosevelt and Banks Lake. The measure for the hatcheries included one constructed in 1991 at Galbraith Springs on the Spokane Indian Reservation operated by the Spokane Tribe of Indians (Spokane Tribal Hatchery), and one constructed in 1991 at Sherman Creek (a northern tributary in Lake Roosevelt operated by the Washington Department of Fish and Wildlife. Operation of the two facilities complement each other. Kokanee eggs collected from Sherman Creek along with rainbow eggs received from WDFW are incubated at the Spokane Tribal Hatchery. These fish are then either transferred to Sherman Creek for final rearing, transferred to net pens for final rearing or planted directly into Lake Roosevelt or Banks Lake after the spring drawdown period.

This was adopted by the NPPC into their 1987 Fish and Wildlife Program (NPPC 1987).

The initial annual production goals were: 13 million kokanee fry, 8 million for outplanting into Lake Roosevelt and 5 million into Banks Lake, and 500,000 rainbow trout to be supplied for Lake Roosevelt net pen rearing operations. The Lake Roosevelt Hatcheries Technical Coordination Team was formed in 1988 to provide guidance in operations, production goals, and stocking strategies on the Lake Roosevelt project. Members of this team include: the Spokane Tribe of Indians (ST), Colville Confederated Tribes (CCT) and WDFW. BPA, Eastern Washington University, Fishery Science Center and the Lake Roosevelt Net Pen Coordinator also serve as advisors who through the Monitoring Program also independently review the restoration and enhancement efforts on Lake Roosevelt.

The fishery managers operating above Chief Joseph / Grand Coulee Dam collectively identified the following biological objectives as partial mitigation for the loss of anadromous salmon and steelhead blocked by Chief Joseph and Grand Coulee Dams (NPPC 95-4).

#### **Lake Roosevelt biological objectives:**

Biological objectives at Lake Roosevelt include the following targets of harvestable sized adult fish:

Species	Stock	Harvest goal (#)	Escapement goal (#)	Total adult fish #	lbs.	Year
kokanee	hatchery	290,000	10,000	300,000	2.0	2000
kokanee (adfluvial)	wild	120,000	60,000	180,000	2.0	*

rainbow trout	net pen	190,000	NA	190,000	1.5 1997
rainbow trout (interim) (adfluvial)	wild	12,000	12,000	18,000	2.0 2000
rainbow trout (adfluvial)	wild	150,000	74,000	224,000	2.0 final
walleye	wild	131,000	U	131,000	1.5 1996

NA = not applicable, U = unknown at present time, \* target date will be determined upon completion of baseline investigations, t = target date will be determined after interim goal is achieved.

The above objectives are integrated into the basis for operation of the two fish hatcheries operating on Lake Roosevelt. Seeking to meet the biological objectives a series of strategies was developed to guide operation and stocking efforts within Lake Roosevelt. These are listed in Section b. Rationale and significance to Regional Programs. Since the natural production of kokanee and rainbow trout in Lake Roosevelt are limited, (Underwood, 1999) due to a lack of available habitat and prohibitive lake level operations, enhancement has become necessary. The use of hatcheries was also identified as a necessary measure to be independent of reservoir fluctuations (Scholz et al. 1986) in the enhancement of resident fisheries on Lake Roosevelt.

Sherman Creek Hatchery was constructed in 1991, at which time WDFW and BPA entered into a non-discretionary 25 year contract to fund the operations and maintenance. It is located immediately adjacent to Lake Roosevelt at the mouth of Sherman Creek. This is three miles west of Kettle Falls, Washington and 101 miles upstream from Grand Coulee Dam. The Hatchery was constructed by Bonneville Power Administration (BPA). Annual operations and maintenance are preformed by Washington Department of Fish and Wildlife with funding provided by BPA. Sherman Creek Hatchery works conductively with the Spokane Tribal Hatchery and the other fishery managers on Lake Roosevelt and Banks Lake to restore and enhance resident fish. Monitoring and evaluation for this project is preformed by the Lake Roosevelt Monitoring / Data Collection Program.

#### **b. Rationale and significance to Regional Programs**

The operations and maintenance of Sherman Creek Hatchery (SCH) are cost-effective and consistent with the Northwest Power Act and the Northwest Power Planning Council's Fish and Wildlife Program, Resident Fish Substitution Biological Objectives and Measures Above Chief Joseph/Grand Coulee Dam (95-4, 1995). SCH produces resident fish for release into Lake Roosevelt and Banks Lake to restore and enhance the recreational fishery and for protection of the resident fish impacted by the construction of Grand Coulee Dam.

Monitoring and evaluation investigations (Peone et al. 1990, Griffith and Scholz 1991, and Thatcher et al. 1993, 1994) indicated that the hatchery program has contributed significantly to increasing both the harvest rates of kokanee and rainbow trout in Lake Roosevelt, as well as the

economic value of the Lake Roosevelt sport fishery. Creel surveys conducted by the U.S. Fish and Wildlife Service from 1980 to 1982 (pre hatchery) estimated the annual harvest of kokanee at 300 to 1,000 fish and the annual harvest of rainbow at 1,000 to 3,000 fish (Beckman et al. 1985).

At that time the number of angler trips was approximately 80,000 per year and the economic value of the fishery was estimated at \$2.8 million. From 1990 to 1996 (post hatchery), harvest ranged from 1,2650 to 32,353 kokanee and 73,777 to 499,293 rainbow trout (Peone et al. 1990; Griffith and Scholz 1991; Thatcher et al. 1993; Chichoz et al. 1997). During this period the number of angler trips ranged from 171,725 to 594,508 and the economic value ranged from \$5.3 to \$20.7 million. In fisheries surveys conducted during this period, over 95% of the kokanee and rainbow collected bore tags or marks indicating they were of hatchery origin (Cichosz et al. 1997).

Seeking to meet the biological objectives, stated in NPPC 95-4 10.8b a series of strategies was developed to guide operation and enhancement efforts. Those strategies state that the Washington Department of Fish and Wildlife and Spokane Tribe of Indians will operate the hatcheries to produce 1 million age 1+ residualized smolt kokanee for release into Lake Roosevelt, including 500,000 reared in the hatcheries and 500,000 reared in net pens, and also produce 500,000 age 0+ rainbow fingerlings for the net pen program (NPPC 95-4 1995). The resident fish strategies further direct the hatcheries to construct and maintain both kokanee and rainbow trout net pens.

### **c. Relationships to other projects**

The Sherman Creek Hatchery (SCH) and Spokane Tribal Hatchery (STH) are operated conjunctively in an effort to maximize the attributes of each facility while optimizing production. The STH is the primary incubation, hatching and early rearing facility while the SCH serves as an acclimation, rearing and release facility up to program limitations. SCH also serves as a support facility for the Lake Roosevelt net pen project. Annual production goals and operational strategies are agreed to by the, Lake Roosevelt Hatchery Coordination Team, a regionally unique forum whose participants include the Spokane Tribe of Indians, Colville Confederated Tribes and WDFW. Other participants who are involved with fishery management and operational concerns on Lake Roosevelt and Banks Lake include; Upper Columbia United Tribes, Eastern Washington University Biology Department, National Park Service, Bonneville Power Administration (BPA) and the Lake Roosevelt Development Association (volunteer rainbow net pen project). Funding for the STH and the net pens, volunteer coordinator is provided by BPA. Fish feed is provided to the rainbow net pen project from WDFW. Rainbow trout and kokanee salmon eggs are provided by WDFW to STH, additional native kokanee eggs were obtained from Kootenay Lake, B.C. and are being reared at the STH.

This project is inter related to the following projects through direct operational objectives or in that all of the projects listed share the complementary goal of resident fishery restoration and enhancement on Lake Roosevelt and Banks Lake.

### **Lake Roosevelt Fishery Enhancement Projects**

Sherman Creek Hatchery O& M (9104700)

Spokane Tribal Hatchery O & M (9104600)	Operated conjunctively with Sherman Creek Hatchery to maximize the attributes of each facility while optimizing production. STH is the primary incubation, and early rearing facility.
Rainbow Trout Net Pens (9104900)	Net Pen Project rears 530,000 rainbow trout yearlings initially raised at Sherman Creek and Spokane Tribal Hatcheries for annual release into Lake Roosevelt.
Lake Roosevelt Kokanee Net Pens (5228100)	These net pens will rear 500,000 kokanee yearlings transferred from Spokane Tribal Hatchery for annual release into Lake Roosevelt.
Lake Roosevelt Monitoring Program (94043000)	Monitors and evaluates effects of hatcheries and stocking on Lake Roosevelt fisheries; collects fisheries and limnological data for reservoir modeling.
Habitat Improvement Project (9001800)	Habitat improvement in Lake Roosevelt tributaries for rainbow trout juvenile rearing and adult passage to increase natural production.
Chief Joseph Kokanee Enhancement Project (9501100)	Monitors native kokanee stock interactions and development, and fish entrainment through Grand Coulee Dam.
Lake Roosevelt Sturgeon Project(9502700)	Restoration and enhancement of the Lake Roosevelt fishery.
Ford Hatchery Water Supply Improvement (NPPC No. 10.8b.24)	Increased kokanee survival through increased yearling releases.
Phalon Lake Wild Rainbow Trapping Facility (NPPC No. 10.8b.25)	This native red band rainbow trout project will supply native trout for net pen and tributary stocking in the Upper Columbia River Basin.
Resident Fish Stock Status Above Chief Joseph/Grand Coulee Dam (NPPC No. 10.8b.26)	Informational exchange / Blocked Area Coordination.

**d. Project history** (for ongoing projects)

The Sherman Creek Hatchery (SCH) is one of two kokanee facilities provided to partially mitigate for the loss of anadromous fish passage and habitat due to the construction of Columbia

River mainstem dams. As a part of this program, the BPA, Spokane Tribe of Indians, Colville Confederated Tribes and WDFW have worked collectively toward the goal of fishery enhancement on Lake Roosevelt and Banks Lake. This Project BPA No. 9104700 and the Northwest Power Planning Council Amendment No. 10.8B.2 and 10.8B Resident Fish Substitution has remained consistent since the inception of this project. The SCH became operational in April 1992 with first releases later that year. The facility has annually produced kokanee salmon and rainbow trout for release since then.

The SCH was designed to rear and acclimate 1.7 million kokanee fry during the spring and to trap available adult kokanee during the fall. Since the inception of the SCH program, the annual production goals have been modified through adaptive management to achieve program objectives. These changes in rearing and stocking strategies have been the result of recommendations made and approved by the Lake Roosevelt Hatcheries Coordination Team (WDFW, STOI, and CCT) in conjunction with BPA. One such change was from fry to post-smolt. During the first four years (1991 - 1995) of hatchery stocking, the emphasis was for production and release of kokanee fry/fingerlings. However, coded wire tag data and a study to chemically imprint and assess smoltification of hatchery produced kokanee indicated that kokanee released as residualized smolts (e.g. yearlings) were captured in higher numbers than kokanee released as fry (Scholz et al. 1993, Tilson et al. 1994 and 1995). Additionally, entrainment losses and predation are thought to be a greater factor for kokanee released as fry as opposed to residualized smolts. (Tilson et al. 1994 and 1995). As a result, the hatcheries have shifted from kokanee fry to residualized smolt (yearling) releases.

This project publishes an annual report (see lists below) on progress made in achieving program goals and objectives. The monitoring and evaluation for this project are preformed by the Lake Roosevelt Monitoring/Data Collection Program BPA No. 9404300 that also produces annual reports along with management recommendations for operations of the Lake Roosevelt Fishery Enhancement Projects.

Since the start of operations in April 1992 the Sherman Creek Hatchery has released the following numbers of fish into Lake Roosevelt:

1992 -	976,925 fingerling kokanee salmon,	45,714 yearling kokanee salmon;
1993 -	902,749 fingerling kokanee salmon,	85,321 yearling kokanee salmon;
1994 -	946,762 fingerling kokanee salmon,	126,159 yearling kokanee salmon;
1995 -		275,609 yearling kokanee salmon;
1996 -		286,253 yearling kokanee salmon;
1997 -		265,313 yearling kokanee salmon;
1998 -		487,000 yearling kokanee salmon.

Starting in 1995, the following rainbow trout were reared at Sherman Creek for fall stocking into net pens on Lake Roosevelt.

1995 -	101,116 fingerling rainbow trout;
1996 -	142,072 fingerling rainbow trout;
1997 -	140,359 fingerling rainbow trout;

1998 - 200,000 fingerling rainbow trout.

### **Sherman Creek Hatchery Annual Reports:**

Combs, Mitch. 1992, 1993, 1994, 1995(I-II), 1996, 1997. Sherman Creek Hatchery Annual Report's. Washington Department of Fish and Wildlife. DE-B179-91BP21191, Bonneville Power Administration, Portland, Oregon.

### **Sherman Creek Hatchery Monthly Reports:**

Combs, Mitch. April, 1992 - November, 1998. Sherman Creek Hatchery Monthly Report's. Washington Department of Fish and Wildlife, Olympia, Washington.

#### **e. Proposal objectives**

Sherman Creek Hatchery is an acclimation, rearing, outplanting, adult trapping, egg taking and support facility for Lake Roosevelt and Banks Lake. It works with the Spokane Tribal Hatchery (9104600) and the volunteer net pen project (9500900) to restore and enhance the resident fisheries on Lake Roosevelt. The monitoring and evaluation for this project are preformed by the Lake Roosevelt Monitoring/Data Collection Program (9404300) which also produces an annual report along with management recommendations for operations of the Lake Roosevelt Fishery Enhancement Projects.

Since the start of operations the annual production goals have been modified through adaptive management to achieve program objectives. These changes in rearing and stocking strategies have been the result of recommendations made and approved by the Lake Roosevelt Hatcheries Coordination Team (WDFW, STOI, and CCT) in conjunction with BPA.

The purpose of Sherman Creek Hatchery is to create a return of locally adapted adult kokanee to Sherman Creek for future broodstock acquisition and enhance the resident fishery within Lake Roosevelt.

The current Annual Production Goals for Sherman Creek Hatchery are:

1. Rear for release in July a maximum of 255,000 Lake Whatcom and native Kootenay Lake Stock kokanee salmon at 15 fish per pound or larger from the Sherman Creek Raceways.
1. Rear for release in May a maximum of 200,000 Lake Whatcom and Native Kootenay Lake Stock kokanee salmon at 15 fish per pound or larger from the Sherman Creek Net Pens.
2. Rear and transfer into Lake Roosevelt Net Pens in October, 200,000 Spokane stock rainbow trout at 15 fish per pound for final rearing and release into Lake Roosevelt, (as available, initiate use of red band rainbow trout for net pen stocking).
3. Trap all returning kokanee adults for spawning and egg taking. Use all available methods to collect, trap, electrofish and net adult kokanee returning to the Sherman Creek area. Collect, compile and manage biological information from returning fish relative to age composition, size, survival, maturity and coded wire tagging.
4. Provide technical assistance, labor and equipment to volunteer cooperators rearing rainbow trout in net pens on Lake Roosevelt.
5. Utilize alternate native brood sources (i e Native Kootenay Lake kokanee / indigenous red band rainbow) as available for use in the Upper Columbia River Basin Waters.

6. Monitor and improve fish health through the examination, diagnosis and treatment of stocks being cultured. Utilize a pro-active approach to fish health to improve survival of both kokanee salmon and rainbow trout to achieve program goals.

**f. Methods**

**Annual Operating Plan Objectives:**

- |                                |                                     |
|--------------------------------|-------------------------------------|
| 1 Yearling Kokanee Acclimation | 7 Outplanting                       |
| 2 Yearling Kokanee Production  | 8 Adult Trapping                    |
| 3 Rainbow Trout Rearing        | 9 Monitor Populations / Adults      |
| 4 Fish Health Monitoring       | 10 Spawning                         |
| 5 Imprinting Strategies        | 11 Alternate broodstocks            |
| 6 Marking / Tagging            | 12 Volunteers / Training / Contacts |

1) Yearling production of approximately 255,000 kokanee, (85,000 fish per raceway) will commence with transfers from the STH in March 2000. These will be received at 25 fish per/lb. and released in late June and early July 2000 at 10+ per/lb.

2) Rearing and acclimation of approximately 200,000 kokanee yearlings via the hatchery net pens. This is done to further our efforts in getting the kokanee to use more of the upper reaches of Lake Roosevelt and to reduce entrainment losses. It also enables us to raise larger fish which decrease predation effects. The fingerlings will go into the net pens in the fall of 1999 at 40 fish per/lb. and will be released in May or June 2000 at approximately 15 fish per/lb.

3) Rear 200,000 rainbow fingerlings for transfer into the Lake Roosevelt Net Pens for winter rearing. These fish will be received from the STH in early July 2000 at 50 fish per/lb. They will then be transferred to the net pens in October 2000 at approximately 15 fish per/lb. This enables the STH to rear additional yearling kokanee for future transfers to SCH and stocking into Lake Roosevelt.

4) The fish health monitoring for both the Sherman Creek and Spokane Tribal Hatcheries are preformed by the WDFW Fish Health Program.

Fish disease prevention and control is based upon a preventative health program concept. This is accomplished through the implementation of a program that involves routine facility visits which monitor the health of the stocks reared. A strong disease control policy (Co-Managers Fish Disease Policy) carefully scrutinizes fish and egg transfers to prevent disease transmission. The SCH attempts to prevent disease through an integrated fish health management program plan that includes improving rearing conditions, improving diets and feeding practices. This strategy helps reduce operating costs but also adds costs by requiring more ponds to produce the same number of fish.

Stock transfer guidelines and hatchery spawning practice guidelines were developed by the Agency in the 1980's. As scientific knowledge has advanced, these guidelines have been modified to reflect that new knowledge.

We will continue to follow the WDFW guidelines for sockeye net pen rearing. These guidelines suggest that the desirable results for a kokanee/sockeye program are attained by using semi-moist / high energy feeds along with higher loading densities. The benefits being realized are increased growth during the cold water rearing periods. Past experience indicates that the overall health of the net pen reared fish has improved with the use of this type of feeds.

5) We continue to seek improved imprinting through our rearing practices and with chemical enhancements. One recommendation of the LRHCT is to administer morpholine during the trapping period to provide an added homing attractant. This is done at SCH with the assistance of Eastern Washington University (EWU).

6) Coordinate between agencies on marking and coded wire tagging. We also help in collection and analyzing of population estimates and catch data.

Collecting tags from recovered kokanee will continue as in previous years with the heads being processed by the monitoring program.

7) Outplanting of the kokanee yearlings will be directly into Lake Roosevelt through the fish ladder or from the net pens located either at the Kettle Falls, Sherman Cove or Colville River sites. We will also attempt to hold fish as late into the summer as possible to reduce predation, lessen entrainment losses and increase overall survival.

8) We will trap all returning adults back to SCH in order to meet program goals. We have made significant improvements in our adult collections which include Floating "Oneida" traps and electrofishing as our primary methods. Any adult kokanee trapped would be either brought into the hatchery raceways or due to cold water temperatures held in wire cages in the cove for spawning.

Because predation and fungus on captured adult kokanee have been a problem in fish held in net pens, any captured adult kokanee may be held at the Colville State Fish Hatchery or in fully enclosed wire cages until spawning. Hatchery staff will continue experimenting with different methods of holding adults for spawning purposes.

9) We will be monitoring fish populations in Lake Roosevelt for any mature kokanee in the area. Our goal is to identify and recover any returning adults. We will also collect, compile and manage biological information from returning fish relative to age composition, size, survival, maturity and coded wire tagging.

10) Spawning operations at SCH will follow WDFW current broodstock collection and Fish Health spawning guidelines and policies. This is to ensure genetic diversity and to prevent the spread of any known pathogens. While at this time egg take goals are at 5 million annually, we will be coordinating with the LRHCT on available adults for broodstock and viable population lots. Egg takes will be fertilized and shipped either "green" or as eyed eggs to the STH for incubation and initial rearing.

We will continue to coordinate between STH, British Columbia Ministry of Environment, Lands and Parks, and the WDFW Lake Whatcom Hatchery for supplying kokanee eggs until such time as we can fulfill the egg allotments using Lake Roosevelt stock.

11) Alternate brood sources (i.e. native Kootenay Lake Stock / native red band rainbow) will continue to be sought and evaluated for future use to: improve returns, supplement native stocks and increase resident populations throughout the reservoir.

12) Provide technical assistance, labor and equipment to volunteer cooperators rearing rainbow trout in net pens on Lake Roosevelt.

The hatchery staff will seek training as per WDFW guidelines to enable them to perform their duties at the hatchery and to be made aware of industry standards and developments.

The hatchery staff will assist with community efforts and media contacts which reflect on the program and efforts of the project.

#### **g. Facilities and equipment**

The SCH was finished and became operational in April 1992. The facility consists of three cement raceways, a gravity flow water intake and associated pipeline, facility support building with visitor area, standard support services (i.e.: domestic water supply, access roads and electrical distribution, etc.) fish ladder/water discharge line, "Oneida" type portable fish trap net, four kokanee net pens at the Sherman Cove and Colville River sites, one on-station hatchery residence (a mobile home placed on the site), one hatchery vehicle and a 16 foot open boat. The computer and fax machine in place at the facility currently meet WDFW minimums.

Operations and maintenance of the facility and equipment will be preformed as per the State of Washington and WDFW policies and guidelines.

Planned modifications currently funded include replacing the trailer house with a permanent residence.

Anticipated costs during FY 2000 include; flood repairs to remove gravel and reestablish the natural channel to protect

operations during annual high water, and replacement of the hatchery vehicle.

**h. Budget**

***FY2000 budget by line item***

<b>Item</b>	<b>Justification</b>	<b>FY2000 (\$)</b>
<b>SHERMAN CREEK HATCHERY OPERATIONS AND MAINTENANCE</b>		
<b>SHERMAN CREEK</b>	<b>FY 2000 ANNUAL BUDGET</b>	
Salaries:		
Fish Hatchery Specialist 3	1.0 FTE 12 months	\$ 72,665
Fish Hatchery Specialist 2	.75 FTE 9 months	
Fish Health Specialist	.08 FTE 1 month	
Division Manager	.08 FTE 1 month	
Holiday/Overtime Pay		
Sick Leave Buyback		
Benefits:		19,967
Goods and Services:		
Fish Feed:		
405,000 Kokanee Yearlings	21,000 lbs @ .51/lb	\$ 10,710
200,000 Rainbow Fingerlings	10,667 lbs @ .35/lb	\$ 3,733
Misc. Supplies	Janitorial and operational	\$ 1,000
Chemicals and Required Permits	Fish therapeutants as required	\$ 500
Books, Maps, Film		\$ 200
Phone	\$ 250/mo * 12 mos	\$ 3,000
Utilities	\$ 400/mo * 12 mos	\$ 4,800
Equipment Rentals	Generators and pumps	\$ 400
Minor Maintenance and Repairs	Repairs to facility as needed	\$ 1,500
Printing	Program informational pamphlets	\$ 300
Visitor Information Materials	Natural resource posters/ pamphlets	\$ 225
Purchased Services	Septic systems pumped	\$ 725
Off-Road Equipment Operation	Fuel and oil for small engines	\$ 750
Domestic Water Monitoring and Treatment	Health Department requirement	\$ 400
Wood and Woodworking Materials	Weir/screens/holding pens	\$ 900
Metal and Metalworking Materials	Holding pen frames/screens	\$ 625
Piping Electrical Materials	Holding pens	\$ 500
Paint	General maintenance	\$ 125
Safety Equipment	WSHA requirements	\$ 500
Road Grading	Access road maintenance	\$ 1,100
Dust Control (Pectin)	Dust control on gravel access road	\$ 1,300
Grounds Maintenance	Fertilizers, noxious weed control, landscaping	\$ 700
Net Pens Maintenance	Net pens, traps and dock repairs	\$ 1,500
	<b>Subtotal:</b>	<b>\$ 35,493</b>
Travel:		
Hatchery Staff Travel	\$ 66.00/day for 14 days	\$ 924
Fish Health Specialist	\$ 66.00/day for 2 days	\$ 132

Airfare	7 trips Spokane/Olympia @ \$132/trip	\$ 924
Vehicle Rental	\$ 48.00/day * 10 days	\$ 400
	<b>Subtotal:</b>	<b>\$ 2,380</b>
Equipment:		
Pickup Truck	Replacement Hatchery Vehicle	\$ 25,000
Fiberglass Tank	300 Gallon Fish Transport Tank	\$ 5,000
	<b>Subtotal:</b>	<b>\$ 30,000</b>
Facility Modifications:		
Facility Maintenance	Operational modifications as needed	\$ 12,000
	<b>Subtotal:</b>	<b>\$ 12,000</b>
Equipment Operation & Maintenance:		
Hatchery Vehicle(s)	\$ 300.00/mo x 12 mos	\$ 3,600
Fish Health Specialist Vehicle Mileage	1000 miles @ \$ 0.35/mi	\$ 350
	<b>Subtotal:</b>	<b>\$ 3,950</b>
Utility Return:		
	\$ 85.00/mo * 12 mos	\$ 1,020
	<b>Subtotal:</b>	<b>\$ 1,020</b>
Administrative Overhead:		
20.0 % of Total less Capital		\$ 25,962
Purchases and Fish Feed	<b>Subtotal:</b>	<b>\$ 25,962</b>
	<b>Project Total:</b>	<b>\$ 201,397</b>

## Section 9. Key personnel

Project Manager: Jerry Moore, Division Manager 0.08 FTE  
Washington Department of Fish and Wildlife  
600 Capitol Way N  
Olympia, WA 98501-1091

This position provides all aspects of project management including supervision, planning coordination, budgetary support, cross-governmental, inter- and intra-agency coordination of hatchery production at Sherman Creek Hatchery.

Mitch Combs, Fish Hatchery Specialist 3 1.0 FTE  
Sherman Creek Hatchery  
3825 Mellenberger Road  
Kettle Falls, WA 99141  
e-mail: mcombs@plix.com

This position provides all on-site hatchery operations and maintenance for

the daily operations of Sherman Creek Hatchery. The position is responsible for ensuring the quality of fish produced and that annual production goals are met in a cost efficient and safe manner. Additional responsibilities include extensive work with public groups, providing technical assistance to volunteer organizations and coordination with Spokane Tribal Hatchery staff to facilitate the movement of fish and/or eggs between the respective facilities.

Steve Roberts, Fish Health Specialist 0.08 FTE  
Washington Department of Fish and Wildlife  
600 Capitol Way N  
Olympia, WA 98501-1091

This position is responsible for all aspects of fish health including the diagnosis of any diseases and prescribing treatments and appropriate therapeutants. Utilizing a pro-active approach to fish health management the incumbent makes routine visits to the Sherman Creek and Spokane Tribal hatcheries to inspect fish health.

## **Section 10. Information/technology transfer**

Information is distributed through the publication of annual reports, community involvement by staff in: local events; thru providing technical assistance to local volunteer groups and facility tours by groups and individuals. Information is also distributed through coordination with Lake Roosevelt Fishery Enhancement project participants through a locally unique coordination forum organized around this project. That forum, entitled the Lake Roosevelt Hatchery Coordination Team comprises representatives from WDFW, Colville Confederated Tribes and Spokane Tribe of Indians. The participants include: BPA, Eastern Washington University Biology Department, National Park Service and the Lake Roosevelt Development Association (rainbow net pen project 9500900).

WDFW participates as a Fishery Manager in the Upper Columbia Blocked Area Management Plan.

SCH also participates in the annual International Kokanee Workshop as an informational exchange of the most current management and rearing strategies dealing with kokanee salmon and reservoir/large lake operations.

## **Congratulations!**